

# Appendix 2: Rapid Stream-Riparian Assessment Score Sheet revised May 2008

Reach Upper Pine Creek Enclosure Stream Pine Creek Watershed Pine Creek Sulphur Bed Allotment

Survey Date June 1, 2008 Time 1029 Background information available? (yes/no) yes

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Contact Info: Address \_\_\_\_\_ Phone \_\_\_\_\_

Reach (UTM) Upstream N-4261962 E-0365039 ☒ Elevation 7390

Photo identification \_\_\_\_\_

NAD 27 Downstream N-4262070 E-0364971 ☒ Elevation 7390

Photo Identification: \_\_\_\_\_

Stream Transect Start 0365039 E 4261962 N Upstream or Down? End

USGS Quad Map Name: \_\_\_\_\_

Scores: WQ 4.5 HG 3.4 F/AH 4.5 RV 3.9 TWH 3.0 Overall Rating 3.9 Condition \_\_\_\_\_

Previous Ratings: DATE \_\_\_\_\_ Overall Score \_\_\_\_\_ Current Trend \_\_\_\_\_

Individual Previous Scores WQ \_\_\_\_\_ HG \_\_\_\_\_ F/AH \_\_\_\_\_ RV \_\_\_\_\_ TWH \_\_\_\_\_

| Score<br>(1-5 or<br>N/A)                    | Indicator<br>Number | Indicator                              | Scoring Definitions and Directions<br>Scores of 5 indicate that the indicator is close to the potential of the geologically and biologically similar reference reach, and/or what would be expected to be found in a healthy ecosystem. Scores of 1 indicate riparian or stream components that are not functioning properly. Use N/A if the indicator is not relevant or appropriate for this particular reach. | Notes on measurement methods  |
|---|---------------------|--|--|---|
| <b>WATER QUALITY</b>                        |                     |  |  |   |
| Score:<br><br><u>5</u><br>%= <u>0</u>       | <u>1</u>            | <b>Algal Growth</b>                    | 1 = >50% of stream bottom covered by filamentous algae based on an average of samples<br>2 = 26-50% of bottom covered by filamentous algae<br>3 = 11-25% of bottom covered by filamentous algae<br>4 = 1-10% of bottom covered by filamentous algae<br>5 = no filamentous algae on stream bottom   | Working downstream, use ocular tube to score 0.5m from bank every 2m in 200m in-stream transect. Don't count single cell algae on the surface of rocks, stream. |
| <u>4</u>                                    | <u>2</u>            | <b>Channel Shading, Solar Exposure</b> | 1 = stream channel completely unshaded (0%) (average of three representative points)<br>2 = slight shading (1-15%)<br>3 = moderate shading (16-30%)<br>4 = substantial shading (31-60%)<br>5 = Channel mostly shaded (>60%)  | Look up and down stream in three different representative points in the overall stream reach. Look for geomorphic consistency.                                  |
| Water quality mean score:<br><br><u>4.5</u> |                     | Notes:<br><br>                         |  |   |

| HYDROGEOMORPHOLOGY (STREAM FORM)          |   |   |   |   |
|---|---|---|---|---|
| Score:<br><br>1<br><br>avg= 1.8           | 3 | <b>Floodplain Connection and Inundation</b> | 1 = >1.7 bankfull / depth ratio average of 3 locations<br>2 = >1.5 - 1.7 bankfull / depth ratio<br>3 = >1.4 - 1.5 bankfull / depth ratio<br>4 = >1.3 - 1.4 bankfull / depth ratio<br>5 = 1.0 - 1.3 bankfull / depth ratio                             | Use field worksheet and measure ratios at three representative locations in the overall stream reach. Calculate the average of three ratios and score using Figure 3. |
| 5<br><br>%= 1                             | 4 | <b>Vertical Bank Stability</b>              | 1 = >90% of channel banks are vertically unstable (use an average of both banks)<br>2 = 61 - 90% of banks are unstable<br>3 = 31 - 60% of banks are unstable<br>4 = 5 - 30% of banks are unstable<br>5 = <5% of banks are unstable                    | Estimate along both banks of 200m in-stream transect. Do not include rock or cliff faces.   |
| 5   | 5 | <b>Hydraulic Habitat Diversity</b>          | 1 = no diversity (variability) of stream form features<br>2 = low diversity, 2 habitat types present,<br>3 = moderate diversity, 3 types present,<br>4 = moderately high diversity, 4 types present,<br>5 = high diversity, 5 present.                | Check in overall walk through. Examples include runs, pools, cobble or boulder debris fans, off-river side channels, backwaters, sand-floored runs, etc.              |
| 5   | 6 | <b>Riparian Area Soil Integrity</b>         | 1 = >25% of surface riparian soil surface disturbed<br>2 = 16 - 25% disturbed<br>3 = 6 - 15% disturbed<br>4 = 1 - 5% disturbed<br>5 = <1% disturbed   | Check in overall walk through. Look for unnatural surface disturbances in the floodplain from such things as vehicles, foot travel, and ungulate activity.            |
| 1   | 7 | <b>Beaver Activity</b>                      | 1 = beavers not now present but were historically<br>2 = no beaver dams, few signs of activity but none in last year<br>3 = activity in past year but no dams<br>4 = beaver dams on some of the stream<br>5 = beaver activity and dams control stream | Check in overall walk through. Beaver sign includes tracks, drags, digging marks, cut stems, burrows, dams, and caches active within past season.                     |
| Hydrogeomorphology mean score:<br><br>3.4 |   | Notes:                                      |   |   |

## FISH/AQUATIC HABITAT

**Qualifier:** If the stream is no longer perennial, but used to be a fishery, the mean score entered for this section is a "1." (It is no longer functioning as fish/aquatic habitat.)

|   |    |  |   |  |
|---|----|--|---|--|
| 5                                       | 8  | <b>Pool Distribution</b>                                   | 1 = no pool habitat in 200m stream transect<br>2 = one to several pools<br>3 = limited to moderate pool and riffle distribution in reach<br>4 = moderate to abundant pool and riffle distribution<br>5 = pools abundant (>50% of transect has pools connected by riffles) | Check along 200m in-stream transect. Look for geomorphic consistency (e.g. high gradient streams will have more pools than low gradient streams).                |
| 2<br>%= 5                               | 9  | <b>Underbank Cover</b>                                     | 1 = no underbank cover in 200m stream transect<br>2 = <10% transect has underbank cover<br>3 = 10 - 25% of transect has underbank cover<br>4 = 26 - 50% of transect has underbank cover<br>5 = >50% of transect has underbank cover                                       | Check along both banks of 200m in-stream transect. Undercut must be at least 15cm (6 in) into the streambank. Average the measures on both banks to score.       |
| 5<br>%= 16                              | 10 | <b>Cobble Embeddedness</b>                                 | 1 = average of >50% of rock volume is imbedded in fine silt. (avg. of three sites)<br>2 = 41 - 50% of rock imbedded<br>3 = 26 - 40% of rock imbedded<br>4 = 20 - 25% of rock imbedded<br>5 = <20% of rock imbedded  | Determine the percent embeddedness of a sample of 6 rocks 3-8" in diameter from riffles in each of three different random points along the overall stream reach. |
| 5                                       | 11 | <b>Aquatic Macro-invertebrate Diversity</b>                | 1 = no aquatic (benthic) macroinvertebrates found<br>2 = 1 macroinvertebrate order present<br>3 = 2 macroinvertebrate orders present<br>4 = 3 macroinvertebrate orders present<br>5 = 4 or more orders present  | Examine 5 rocks 15cm (6") or larger at the same sites used for Indicator 10. Use Appendix 2 or other guide to identify macroinvertebrate orders.                 |
| 5                                       | 12 | <b>Large Woody Debris</b>                                  | 1 = no large woody debris (LWD) in transect<br>2 = <3 LWD pieces in transect<br>3 = 3 - 5 LWD pieces in transect<br>4 = 6 - 10 LWD pieces in transect<br>5 = >10 LWD pieces in transect   | Count woody debris pieces larger than 15cm (6") in diameter and 1m (3 ft) long or longer in the channel in the 200m in-stream transect                           |
| 5<br>%= 82                              | 13 | <b>Overbank Cover and Terrestrial Invertebrate Habitat</b> | 1 = no grass, shrubs, or trees overhang water<br>2 = <10% of banks have grass, shrubs, or trees that overhang the water<br>3 = 10 - 25% of banks have overhanging veg.<br>4 = 26 - 50% of banks have overhanging veg.<br>5 = >50% of banks have overhanging veg.          | Check along both banks of 200m in-stream transect. Look for geomorphic consistency. Do not include rocks or cliff faces. Average both banks when scoring.        |
| Fish/Aquatic Habitat mean score:<br>4.5 |    | Notes:   |   |  |

## RIPARIAN VEGETATION

G= 58 %

S= 47 %

LC= 18 %

UC= 12 %

G= 73 %

S= 24 %

LC= 6 %

UC= 11 %

|                    |           |  |   |   |
|--------------------|-----------|--|---|---|
| Score:<br><b>3</b> | <b>14</b> | <b>Lower Riparian Zone Plant Community Structure and Cover</b> | 1 = <5% average plant cover in lower riparian zone (LRZ)<br>2 = 5 - 25% average plant cover in LRZ<br>3 = 26 - 50% average plant cover in LRZ<br>4 = 51 - 80% average plant cover in LRZ<br>5 = >80% average plant cover in LRZ                                     | Use the field worksheet and ocular tube to determine the cover for the ground, shrub, midcanopy and upper canopy layers along 200m transect in the lower riparian zone. Look for geomorphic consistency.                    |
| Score:<br><b>3</b> | <b>15</b> | <b>Upper Riparian Zone Plant Community Structure and Cover</b> | 1 = <5% average plant cover in upper riparian zone (URZ)<br>2 = 5 - 25% average plant cover in URZ<br>3 = 26 - 50% average plant cover in URZ<br>4 = 51 - 80% average plant cover in URZ<br>5 = >80% average plant cover in URZ                                     | Use the field worksheet and ocular tube to determine the cover for ground, shrub, midcanopy and upper canopy layers along the 200m transect in the upper riparian zone. Look for geomorphic consistency.                    |
| <b>4</b>           | <b>16</b> | <b>Shrub Demography and Recruitment</b>                        | 1 = no native shrubs present in study reach<br>2 = one age class present<br>3 = two classes present, one class with seedlings or saplings<br>4 = three age classes present<br>5 = all age classes present   | Determine during the overall walk through the number of age classes (seedlings, saplings, mature, standing dead) for the dominant (most common) native shrub species.   |
| <b>4</b>           | <b>17</b> | <b>Tree Demography and Recruitment</b>                         | 1 = no native trees present in study reach<br>2 = one age class present<br>3 = two classes present, one class with seedlings or saplings<br>4 = three age classes present<br>5 = all age classes present  | Determine during the overall walk through the number of age classes (seedlings, saplings, mature, standing dead) for the dominant (most common) deciduous native tree species.  |
| <b>2</b>           | <b>18</b> | <b>Non-native Herbaceous Plant Species</b>                     | 1 = >50% of herbaceous plant cover are not native species<br>2 = 26 - 50% herbaceous not native<br>3 = 11 - 25% herbaceous not native<br>4 = 5 - 10% herbaceous not native<br>5 = <5% of herbaceous cover not native  | Estimate on the overall walk through.   |
| <b>5</b>           | <b>19</b> | <b>Non-native Woody Plant Species</b>                          | 1 = >50% of woody plant cover are not native species<br>2 = 26 - 50% of woody cover not native<br>3 = 11 - 25% of woody cover not native<br>4 = 5 - 10% of woody cover not native<br>5 = <5% of woody cover not native  | Estimate on the overall walk through.   |
| <b>5</b><br>%= 0   | <b>20</b> | <b>Mammalian Herbivory (Grazing) Impacts on Ground Cover</b>   | 1 = >50% of plants impacted by grazing, signs of ungulates common (scat, trampling and trails)<br>2 = 26 - 50% of plants impacted, ungulate use signs are common<br>3 = 11 - 25% of plants impacted<br>4 = 5 - 10% of plants impacted<br>5 = <5% of plants impacted | Use the field worksheet and ocular tube to determine the number of "hits" showing herbivory on the ground covering plants (grasses and forbs) on the LRZ and URZ 200m transects. Use average of the two transects to score. |

## RIPARIAN VEGETATION, CONTINUED

|   |    |   |   |  |
|---|----|---|---|--|
| 5 | 21 | <b>Mammalian Herbivory (Browsing) Impacts on Shrubs and Small Trees</b> | <p>1 = &gt;50% of plants (shrubs and trees) impacted based on the average of two transects</p> <p>2 = 26 - 50% of plants impacted</p> <p>3 = 11 - 25% of plants impacted</p> <p>4 = 5 - 10% of plants impacted</p> <p>5 = &lt;5% of plants impacted</p> | Average measurements from the URZ and LRZ transects to estimate the percentage of shrubs and small trees that have branch tips that have been clipped or eaten by large mammals. |
|---|----|---|---|--|

% = 4

Riparian Vegetation,  
mean score:

3.9

Notes:

## TERRESTRIAL WILDLIFE HABITAT

|   |    |  |  |   |
|---|----|--|--|---|
| 2 | 22 | <b>Shrub Patch Density</b>                         | <p>1 = no shrub patches in stream reach</p> <p>2 = few, isolated shrub patches</p> <p>3 = more patches still isolated</p> <p>4 = few large open areas between large patches</p> <p>5 = almost continuous dense shrub cover</p>                               | In overall walk through, examine patches and clusters of shrubs (<4m tall) and openings between those clusters. Look for geomorphic consistency.                        |
| 2 | 23 | <b>Mid-Canopy Patch Density</b>                    | <p>1 = no mid-canopy shrub or tree patches in reach</p> <p>2 = few isolated small patches in mid canopy</p> <p>3 = more patches still isolated</p> <p>4 = few large open areas between large patches</p> <p>5 = almost continuous dense mid-canopy cover</p> | In overall walkthrough, examine clusters of mid-canopy large shrubs and trees (4-10m tall) and openings between those clusters. Look for geomorphic consistency.        |
| 3 | 24 | <b>Upper Canopy Patch Density and Connectivity</b> | <p>1 = no upper-canopy trees present in reach</p> <p>2 = few isolated small patches in upper canopy</p> <p>3 = isolated patches</p> <p>4 = few large open areas between large patches</p> <p>5 = almost continuous dense upper-canopy cover</p>              | In overall walk through, examine clusters of upper canopy trees (>10m tall) and openings between those clusters. Look for geomorphic consistency.                       |
| 5 | 25 | <b>Fluvial Habitat Diversity</b>                   | <p>1 = no other fluvial habitat besides the stream channel</p> <p>2 = one other type of fluvial habitat present</p> <p>3 = two other types present</p> <p>4 = three other types present</p> <p>5 = four or more other types present</p>                      | Examine during overall walk through. Fluvial habitat types include flood-plain ponds, oxbows, side channels, sand bars, wet meadows, beaver ponds, and stable cutbanks. |

Terrestrial Wildlife  
Habitat, mean score:

3.0

Notes:

Doug Sorensen noted that willows might not be expected here.

**Overall Comments:**

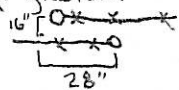
This enclosure has been here at least 20 yrs (approx 1978 or earlier),  
personal memory Joe Hardy.

It is too early in the growing season to see tree seedlings and shrub seedlings

This may be a source stream for Bonneville Cutthroat trout. - Doug Sorensen

The stream has a steep gradient

Enclosure walk gate



16" wide, 28" long overlap of fence  
opening,

Attach field worksheets (including the human impact worksheet) to this score sheet